In the claims:

Please amend the claims as follows:

1. (Original) A method of data transmission in an oil well environment, the method comprising the steps of:

providing a reference data signal to an adaptive transmitter controller having an acoustic transmitter;

transmitting an acoustic reference signal, corresponding to the reference data signal, from an acoustic transmitter at first location along an acoustic channel;

detecting the acoustic reference signal at a second location along the acoustic channel, the acoustic reference signal distorted from the acoustic effects of the transmitter and the acoustic channel;

generating a measured reference data signal in response to the detected acoustic reference signal;

inputting the measured reference data signal to the adaptive transmitter controller; and

utilizing the adaptive transmitter controller to optimally drive the acoustic transmitter by providing modified reference data signals for transmission, the modified reference data signals related to the reference data signal by a mathematical function and selected to counteract the distorting acoustic effects of the transmitter and acoustic channel.

2. (Original) A method as in claim 1, further comprising the step of providing a reference control signal, related to the reference data signal, from the transmitter controller to an acoustic transmitter.

3. (Original) A method as in claim 1, wherein the adaptive transmitter controller comprises a frequency domain filter.

4. (Original) A method as in claim 1, wherein the adaptive transmitter controller comprises a neural network.

5. (Original) A method as in claim 4, wherein the neural network is a nonlinear recurrent neural network.

6. (Original) A method as in claim 1, wherein the acoustic transmitter is positioned downhole.

7. (Original) A method as in claim 1, the adaptive transmitter controller further comprising a system identification model.

8. (Original) A method as in claim 7, wherein the system identification model comprises a neural network.

9. (Original) A method as in claim 1, wherein the first location along the acoustic channel is downhole from the second location along the acoustic channel.

10. (Original) A method as in claim 1, wherein the transmitter controller is remotely located from the acoustic transmitter.

11. (Original) A method as in claim 1, wherein the reference data signal is a pre-selected training signal for training the adaptive transmitter controller.

12. (Original) A method as in claim 1, further comprising the step of positioning a communication unit at a third location along the acoustic channel for detection of transmitted signals.

13. (Original) A method as in claim 1, further comprising training the adaptive transmitter controller.

14. (Original) A method as in claim 13, wherein the step of training includes temporarily placing an acoustic receiver on a wireline at the second location.

15. (Original) A method of transmitting data in an oil well environment comprising the steps of:

transmitting data signals from a transmitter into an acoustic channel;

detecting the corresponding transmitted data signals and inputting the transmitted data signals into an adaptive transmitter controller; and

utilizing the adaptive transmitter controller to optimally drive the transmitter by adaptively modifying later-transmitted data signals to counteract the distorting effects of the transmitter and acoustic channel on the transmitted signals.

16. (Original) A method as in claim 15, further comprising the step of receiving the later sent signals at a remote location along the acoustic channel.

17. (Original) A method as in claim 15, wherein the adaptive transmitter control comprises a neural network.

18. (Original) A method as in claim 15, wherein the adaptive transmitter controller comprises a system identification model.

19. (Original) A method as in claim 16, wherein the step of detecting comprises placing an acoustic receiver along the acoustic channel at a testing location, the testing location closer to the transmitter than the remote location.

20. (Original) A method of transmitting data in an oil well environment comprising the steps of:

providing a reference data signal to an adaptive transmitter controller having an acoustic transmitter;

transmitting an acoustic reference signal, corresponding to the reference data signal, from an acoustic transmitter at first location along an acoustic channel;

detecting the acoustic reference signal at a second location along the acoustic channel, the acoustic reference signal distorted from the acoustic effects of the transmitter and the acoustic channel;

generating a measured reference data signal in response to the detected acoustic reference signal;

inputting the measured reference data signal to the adaptive transmitter controller; and

utilizing the adaptive transmitter controller to find a reference signal error and to optimally drive the acoustic transmitter by providing modified data signals for transmission along the acoustic channel, the modified data signals having corresponding modified signal errors upon detection at the second location along the acoustic channel, the modified data signals selected to minimize the corresponding modified signal errors.

21. (Original) A method as in claim 20, further comprising the step of mathematically modeling the acoustic transmitter and acoustic channel.

22. (Original) A method as in claim 20, further comprising the step of transmitting the modified data signals to an acoustic receiver at a third location along the acoustic channel.

23. (Original) A method as in claim 20, wherein the adaptive transmitter controller comprises a neural network.

24. (Presently Amended) An apparatus for transmitting data along an acoustic channel in an oil well environment, the apparatus comprising:

an adaptive transmitter controller for optimally driving an acoustic transmitter ~~controller~~; and

an acoustic transmitter operatively connected to the controller and operatively connected to the acoustic channel at a first location to transmit along the channel; and

an acoustic receiver placed along the acoustic channel at a second location, the receiver operably connected to the adaptive transmitter controller.

25. (Original) An apparatus as in claim 24, further comprising another acoustic receiver placed along the acoustic channel at a remote location.

26. (Original) An apparatus as in claim 24, the adaptive transmitter controller having a neural network.

27. (Presently Amended) An apparatus as in claim 24, the adaptive transmitter controller for ~~capable of~~ mathematically modeling the acoustic effects of the transmitter and the acoustic channel.

28. (Original) An apparatus as in claim 24, the acoustic receiver connected to the adaptive transmitter controller by a wireline.